CALS TEST NETWORK

AFCTN Test Report 93-050

AFCTB-ID 93-037

Technical Publication Transfer

Using:

Cubic Defense Systems' Data

MIL-R-28002A (Raster)

Quick Short Test Report

17 April 1993

Prepared for

Electronic Systems Center

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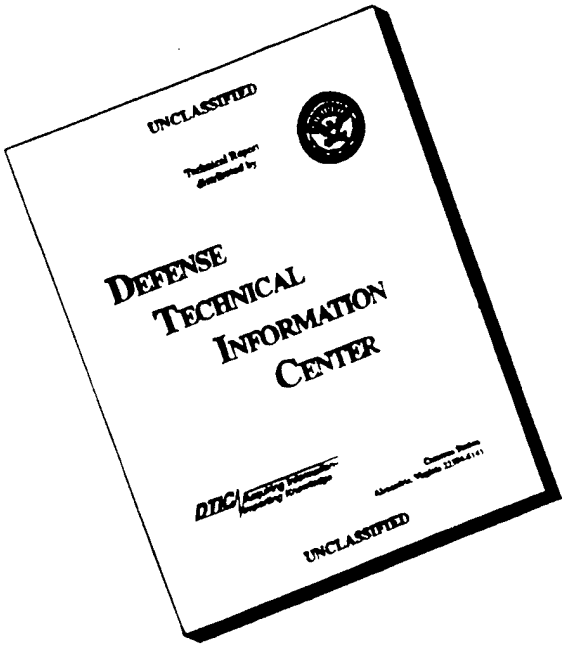

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Contents

1. Introduction

1.1 Background

The Department of Defence (DoD) Air Force Continuous Acquisition and Life-Cycle Support (CALS) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALS initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the AFCTN technical staff, gain experience using the standards, and develope increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze Cubic Defense Systems' interpretation and use of the CALS standards in transferring technical Raster publication data. Cubic Defense Systems used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff on a 9-track magnetic tape.

2. Test Parameters

Test Plan: AFCTB 93-037

Date of Evaluation: 17 April 1993

Evaluator:
George Elwood
Air Force CALS Test Bed
DET HQ ESC/ENCP
4027 Colonel Glenn Hwy
Suite 300
Dayton OH 45431-1672

Data Originator:
Jay Aronson
ASC OL/YOAS
102 W D Ave Ste 300
Eglin AFB FL 32542-6808
(DSN) 872-9392 x325

Cubic Corporation
9333 Balboa Avenue
San Diego CA 92186-5587

Data Description: Technical Manual Test
6 Document Declaration files
20 Raster files

Data Source System:

1840

HARDWARE
Unknown

SOFTWARE
Unknown

Raster

HARDWARE
Unknown

SOFTWARE
Unknown

Evaluation Tools Used:

MIL-STD-1840A (TAPE)

SUN 3/280

AFCTN *Tapetool v1.2.8 UNIX*
XSoft *CAPS/CALS v40.4*
Texas Instruments (TI) *Tapetool v1.0.1*

PC 486/50

AFCTN *Tapetools v1.2.8 DOS*

MIL-R-28002 (Raster)

SUN SparcStation 2

ArborText *g42tiff*
XSoft *CAPS ccitt2caps v6.0x*
AFCTN *validg4*
AFCTN *calstb.475*
IGES Data Analysis (IDA) *IGESView v3.0*
Island Graphics *IslandPaint v3.0*

Cheetah

Inset Systems *HiJaak v2.1*
Inset Systems *HiJaak Window v1.0*
Software Publishing Corporation (SPC) *Harvard Graphics v3.0*
Corel *Ventura Publisher*

Standards Tested:

MIL-STD-1840A
MIL-R-28002A

3. 1840A Analysis

3.1 External Packaging

The tape arrived at the Air Force CALS Test Bed (AFCTB) enclosed in a box in accordance with ASTM D 3951. The exterior of the box was not marked with the magnetic tape warning label, as required by MIL-STD-1840A, para. 5.3.1.3.

The tape was enclosed in a barrier bag as required by MIL-STD-1840A, para. 5.3.1.2. Inspection of the tape reel showed the label indicating the recording density, as required by MIL-STD-1840A, para. 5.3.1. A packing list, showing all files recorded on the tape, was not enclosed.

3.2 Transmission Envelope

The 9-track tape received by the AFCTB contained MIL-STD-1840A files. The files were named per the standard conventions.

3.2.1 Tape Formats

The tape was run through the AFCTN *Tapetool v1.2.8* utility. Fifty-two errors and nine notes were encountered while evaluating the contents of the tape labels. All file names were ended with a period, which is not permitted by MIL-STD-1840A, para. 5.1.1.1.

The Document Declaration files were defined as fixed length files when they should have been "D" variable length. The expected block length was 260 when it was defined as 2048.

All 20 Raster files were reported with an incorrect Raster record size. The value should have been 128 when it was defined as 2048 on the tape.

See the Appendix for sample log files.

The tape was read using TI's *Tapetool*. The same errors were reported.

The tape was read using XSoft's *CAPS read1840A* utility. While no errors were reported, only the last document Raster files were saved. The XSoft utility creates sub-directories based on information in the CALS header. The NONE value in the header resulted in the files all being placed in the same sub-directory, over writing the previous files.

The physical structure of the tape did not meet the CALS MIL-STD-1840A requirements.

3.2.2 Declaration and Header Fields

Because of errors in the naming of the files, parsing the data files could not be completed.

4. IGES Analysis

No Initial Graphics Exchange Specification (IGES) files were included on this tape.

5. SGML Analysis

No Standard Generalized Markup Language (SGML) files were included on this tape.

6. Raster Analysis

The tape contained 20 Raster files. All files were evaluated using the AFCTN *validg4* utility. This program reported that files R201, 202, 203, 204, 205, 206, 301, 401, 501, 602, 603, and 604 were not valid CALS Raster files. The errors were traced to missing EOF file coding.

The files were read into the AFCTN Raster viewer *calstb.475*. The files defined above could be read into the program, although a core dump was noted. Nothing displayed on the screen for the noted files.

The AFCTB has several tools for viewing Raster files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The files were converted using Inset Systems' *HiJaak* without a reported error. The resulting files were read into Corel's *Ventura Publisher*, displayed and printed.

A sample of the files were read into IDA's *IGESView*, displayed and printed without a problem.

A sample of the files were read into Inset System's *HiJaak for Windows*, displayed and printed without a problem.

A sample of the files were converted using ArborText's *g42tiff* without a reported error. The resulting files were imported into Island Graphics' *IslandPaint* and displayed. When attempting to print the files, the system reset itself.

The Raster files do not meet the CALS MIL-R-28002A specification because of missing EOF coding.

7. CGM Analysis

No Computer Graphics Metafile (CGM) files were included on this tape.

8. Conclusions and Recommendations

In summary, the physical structure of the tape from Cubic Defense Systems had basic errors. The files were named with a period which is not permitted. The same file types were incorrect and record sizes were incorrect.

Most of the Raster files were reported as having errors. The errors were traced to missing EOF coding. This error was probably caused by writing the tape using incorrect block factors. The correct files were acceptable only because they happen to be the correct length. The Raster files do not meet the CALS MIL-R-28002A specification.

The tape from Cubic Defense Systems does not meet the CALS MIL-STD-1840A requirements.

9. Appendix A - Tapetool Report Logs

9.1 Tape Catalog

```
Air Force CALS Test Network Catalog Evaluation - Version 1.2; Release Number 8

  Standards referenced:
    MIL-STD-1840A (1987) - Automated Interchange of Technical Information
    ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
                        for Information Interchange
    ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Fri Apr 16 15:00:18 1993

MIL-STD-1840A File Catalog

File Set Directory: /cals/tapetool8/Set089

                                                                    Page: 1

                                                  Record
                                                  Format/     Block      Selected/
File Name                File Type                Length  Length/Total  Extracted
-------------------------------------------------------------------------------
D001.                    Document Declaration     F/02048 02048/000001  Extracted
*** ERROR (MIL-STD-1840A; 5.1.1.1,5.1.3) - File name contains
    a punctuation character.
Renaming file from => /cals/tapetool8/Set089/D001.
             to => /cals/tapetool8/Set089/D001
*** ERROR (MIL-STD-1840A; 5.2.1.3) - Invalid Recording Format:
    Header => F, Expected => D
*** NOTE (MIL-STD-1840A; 5.2.1.3) - Unexpected maximum variable record size
    encountered. Header => 2048, Expected => 260
*** NOTE (ANSI X3.27; 8.5.2.6) - Record Length for Recording Format Type D
    shall be the maximum length of a Measured Data Unit (MDU).
*** NOTE (ANSI X3.27; 7.2.3) - A variable length record shall be contained
    in an MDU. An MDU consists of a four byte Record Control Word (RCW)
    followed immediately by the variable record.
*** NOTE (ANSI X3.4) - A Record Control Word shall consist of four characters
    that express the sum of the lengths of the RCW and the variable record.

                        <<<<< PART OF LOG FILE REMOVED HERE >>>>>

D001R001.                Raster                   F/02048 02048/000010  Extracted
```

```
*** ERROR (MIL-STD-1840A; 5.1.1.1,5.1.3) - File name contains
    a punctuation character.
Renaming file from => /cals/tapetool8/Set089/D001R001.
             to => /cals/tapetool8/Set089/D001R001
*** ERROR (MIL-STD-1840A; 5.2.1.6) - Invalid fixed record size encountered.
    Header => 2048, Expected => 128

                          <<<<< PART OF LOG FILE REMOVED HERE >>>>>

D006R004.                Raster                    F/02048 02048/000028
Extracted *** ERROR (MIL-STD-1840A; 5.1.1.1,5.1.3) - File name contains a
    punctuation character.
Renaming file from => /cals/tapetool8/Set089/D006R004.
    to => /cals/tapetool8/Set089/D006R004
*** ERROR (MIL-STD-1840A; 5.2.1.6) - Invalid fixed record size encountered.
    Header => 2048, Expected => 128
Catalog Process terminated with 52 error(s), 0 warning(s), and 9 note(s).
```

9.2 Tape Evaluation Log

```
Air Force CALS Test Network Tape Evaluation - Version 1.2; Release Number 8
  Standards referenced:
    ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
                        for Information Interchange
    ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Fri Apr 16 14:59:55 1993

ANSI Tape Import Log

Allocating tape drive /dev/rmt0...

/dev/rmt0 allocated.

VOL1CALS01                                                              3

  Label Identifier: VOL1
  Volume Identifier: CALS01
  Volume Accessibility:
  Owner Identifier:
  Label Standard Version: 3

HDR1D001.            CALS0100010001000100 93084 93084 000000DECFILE11A

  Label Identifier: HDR1
  File Identifier: D001.
  File Set Identifier: CALS01
  File Section Number: 0001
  File Sequence Number: 0001
  Generation Number: 0001
  Generation Version Number: 00
  Creation Date:  93084
  Expiration Date:  93084
  File Accessibility:
  Block Count: 000000
  Implementation Identifier: DECFILE11A

HDR2F0204802048                     M             00

  Label Identifier: HDR2
  Recording Format: F
  Block Length: 02048
  Record Length: 02048
  Offset Length: 00
```

```
************ Tape Mark ***************

  Actual Block Size Found = 2048 Bytes.

  Number of data blocks read = 1.

************ Tape Mark ***************

EOF1D001.           CALS0100010001000100 93084 93084 000001DECFILE11A

  Label Identifier: EOF1
  File Identifier: D001.
  File Set Identifier: CALS01
  File Section Number: 0001
  File Sequence Number: 0001
  Generation Number: 0001
  Generation Version Number: 00
  Creation Date:  93084
  Expiration Date:  93084
  File Accessibility:
  Block Count: 000001
  Implementation Identifier: DECFILE11A

EOF2F0204802048                    M             00

  Label Identifier: EOF2
  Recording Format: F
  Block Length: 02048
  Record Length: 02048
  Offset Length: 00

************ Tape Mark ***************

                          <<<<< PART OF LOG FILE REMOVED HERE >>>>>

************ Tape Mark ***************

HDR1D006R004.       CALS0100010026000100 93084 93084 000000DECFILE11A

  Label Identifier: HDR1
  File Identifier: D006R004.
  File Set Identifier: CALS01
  File Section Number: 0001
  File Sequence Number: 0026
  Generation Number: 0001
  Generation Version Number: 00
```

```
  Creation Date:  93084
  Expiration Date:  93084
  File Accessibility:
  Block Count: 000000
  Implementation Identifier: DECFILE11A

HDR2F0204802048                    M             00

  Label Identifier: HDR2
  Recording Format: F
  Block Length: 02048
  Record Length: 02048
  Offset Length: 00

************ Tape Mark ***************

  Actual Block Size Found = 2048 Bytes.

  Number of data blocks read = 28.

************ Tape Mark ***************

EOF1D006R004.        CALS0100010026000100 93084 93084 000028DECFILE11A

  Label Identifier: EOF1
  File Identifier: D006R004.
  File Set Identifier: CALS01
  File Section Number: 0001
  File Sequence Number: 0026
  Generation Number: 0001
  Generation Version Number: 00
  Creation Date:  93084
  Expiration Date:  93084
  File Accessibility:
  Block Count: 000028
  Implementation Identifier: DECFILE11A

EOF2F0204802048                    M             00

  Label Identifier: EOF2
  Recording Format: F
  Block Length: 02048
  Record Length: 02048
  Offset Length: 00

************ Tape Mark ***************
```

```
************ Tape Mark ***************

############ End of Volume CALS01 ##############

############ End Of Tape File Set ##############

Deallocating /dev/rmt0...

Tape Import Process terminated with 0 error(s), 0 warning(s),
and 0 note(s).
```

9.3 Tape File Set Validation Log

```
Air Force CALS Test Network File Set Evaluation - Version 1.2; Release Number 8
  Standards referenced:
    MIL-STD-1840A (1987) - Automated Interchange of Technical Information
    MIL-R-28002 (1989) - Raster Graphics Representation In Binary
                         Format, Requirements For

Fri Apr 16 15:00:21 1993

MIL-STD-1840A File Set Evaluation Log

File Set: Set089

Found file: D001
Extracting Document Declaration Header Records...
*** ERROR (get_headers) - Maximum record length of
    (= 256) exceeded in header record 1 of header file:
    /cals/tapetool8/Set089/D001/D001_HDR.
    It will be truncated from 258 to 256 characters.

*** ERROR (MIL-STD-1840A; 5.1) - Invalid number of header records.
    Expected = 15; Records read = 1
    from /cals/tapetool8/Set089/D001/D001_HDR.


*** I/O ERROR - MIL-STD-1840A Document Declaration Header Records
    could not be extracted from
    /cals/tapetool8/Set089/D001/D001_HDR

                          <<<<< PART OF LOG FILE REMOVED HERE >>>>>


A grand total of 6 error(s), 0 warning(s), and 0 note(s) were
encountered in this File Set.

MIL-STD-1840A File Set Evaluation Complete.
```

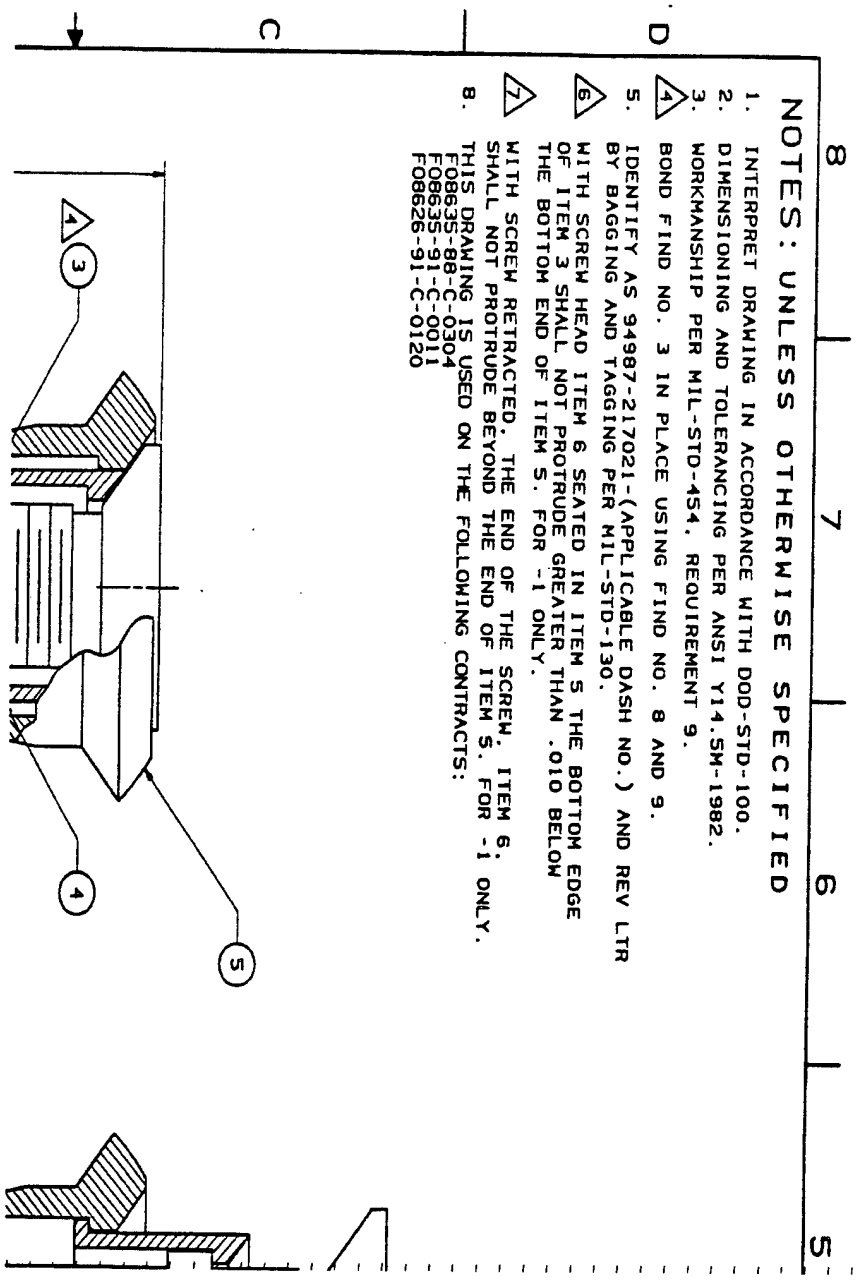
10. Appendix B - Detailed Raster Analysis

10.1 File D001R001

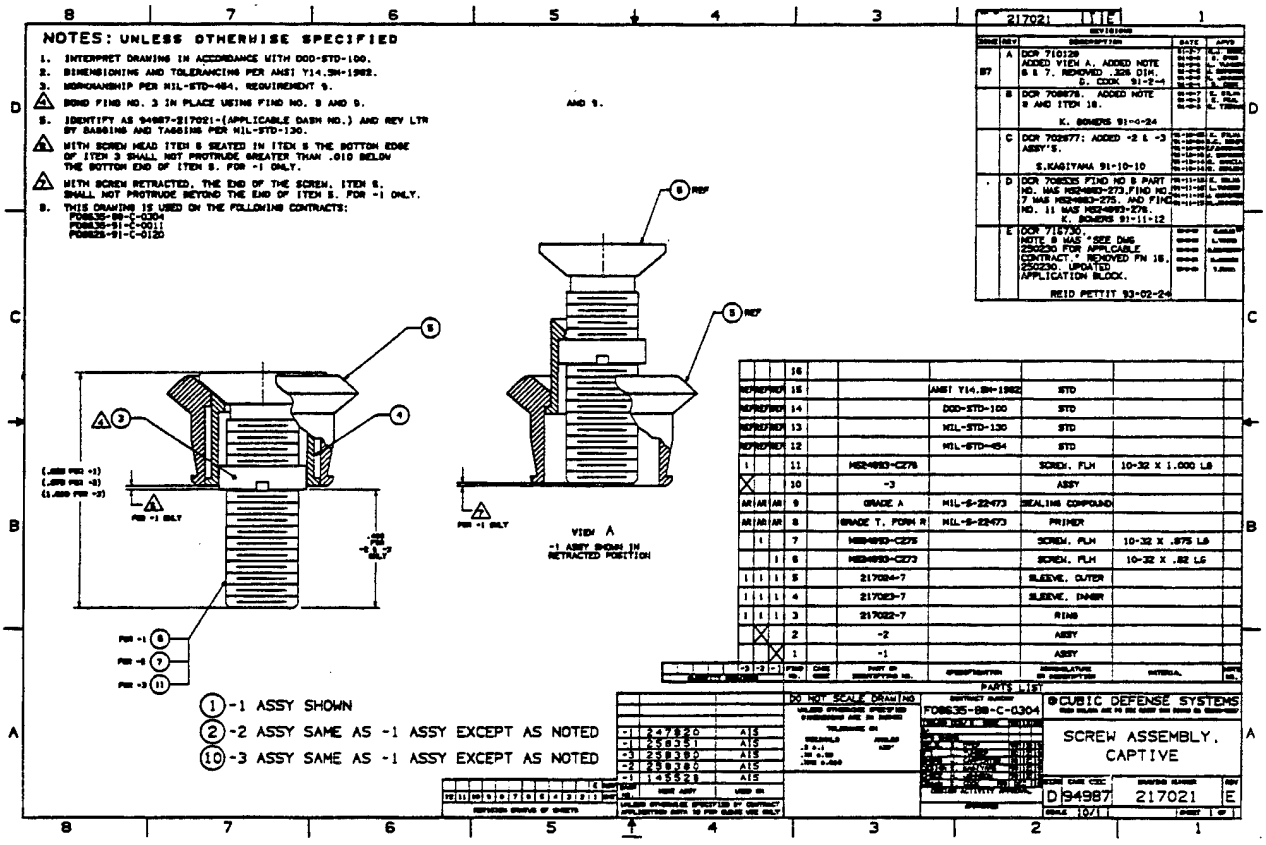
10.1.1 validg4 Error Log

```
 density      = 200
 path length  = 7168
 scan lines   = 4608
 bit format   = MSB

error, scan length exceeds pel count
s=4610 a0=0 bstop=7169 pos=-13462

file = D003R001
```

10.1.2 Output HiJaak for Windows



10.1.3 Output IGESView

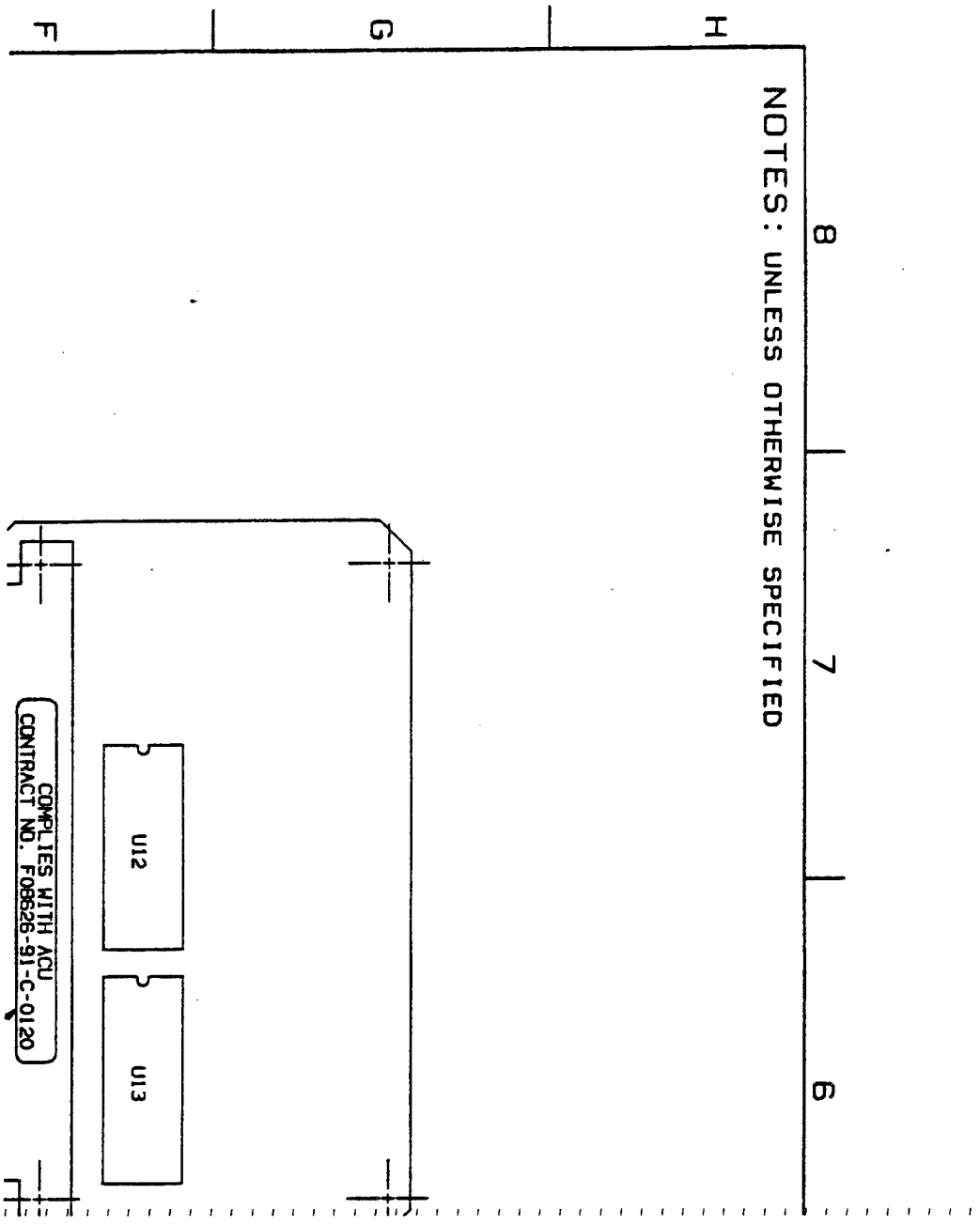


10.2 File D006R003

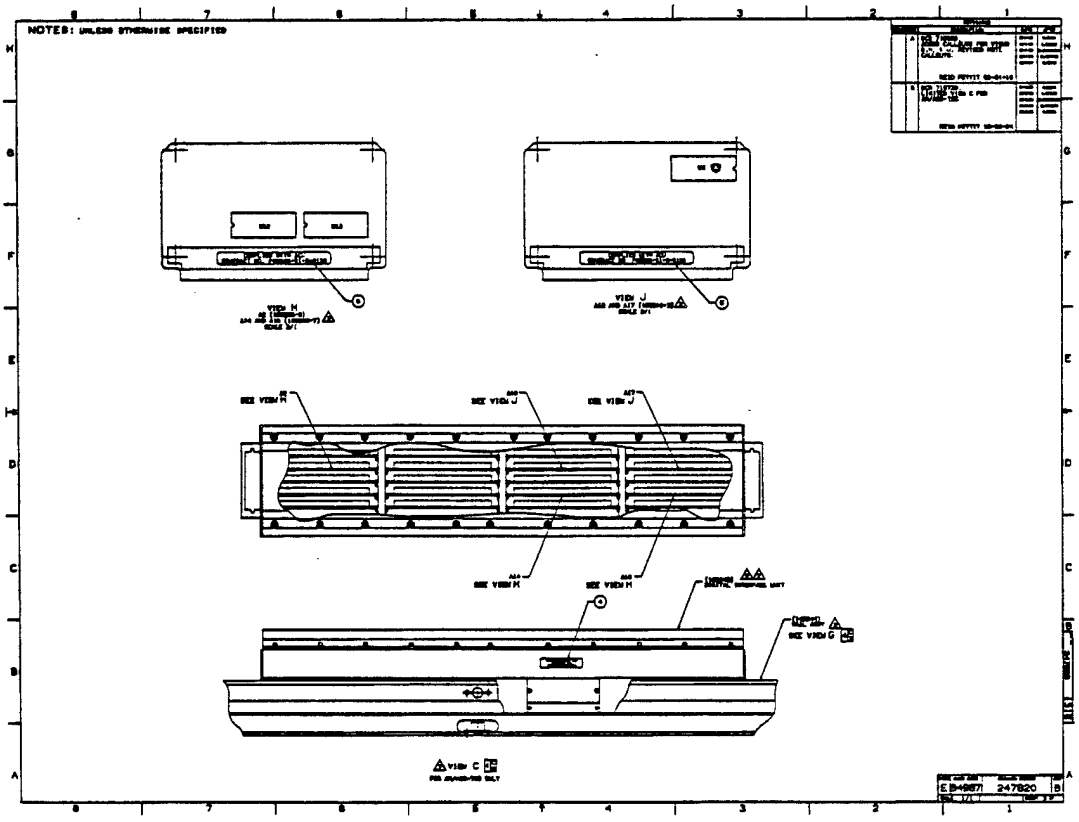
10.2.1 validg4 Error Log

```
 density      = 200
 path length = 9216
 scan lines   = 7168
 bit format   = MSB

error, scan length exceeds pel count
s=7171 a0=0 bstop=9224 pos=1376

file = D006R003
```

10.2.2 Output HiJaak for Windows

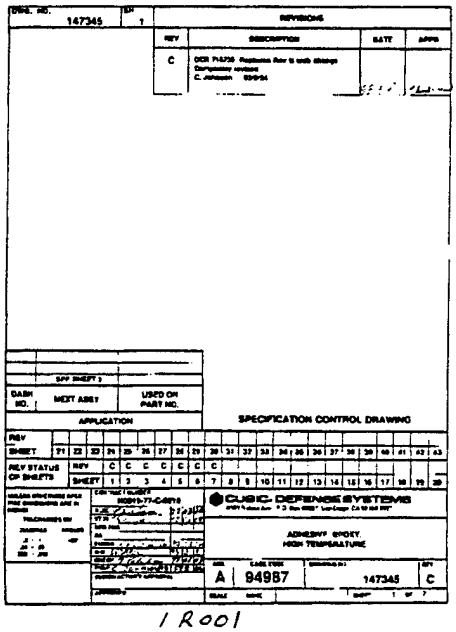


10.2.3 Output IGESView

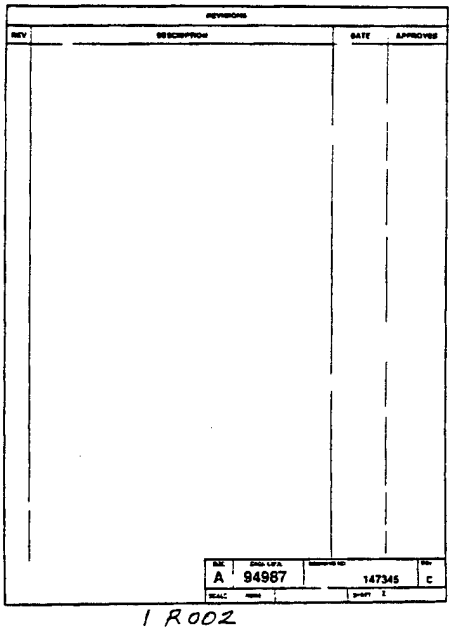


10.3 Output HiJaak/Ventura Publisher

10.3.1 Files 1R001, 1R002, 1R003, and 1R004



1R001



1R002

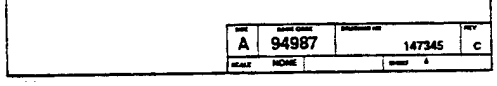
1R003

APPLICATION		
DASH NO.	NEXT ASSY	USED ON PART NO
-1	145526	AR
-1	145653	AR
-1	146961	AR
-1	148290	AR
-1	217620	AR
-1	226351	AR
-1	254390	AR

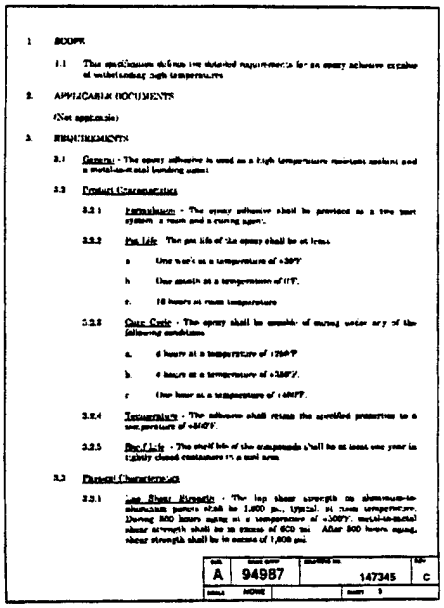
1R004

NOTES: UNLESS OTHERWISE SPECIFIED

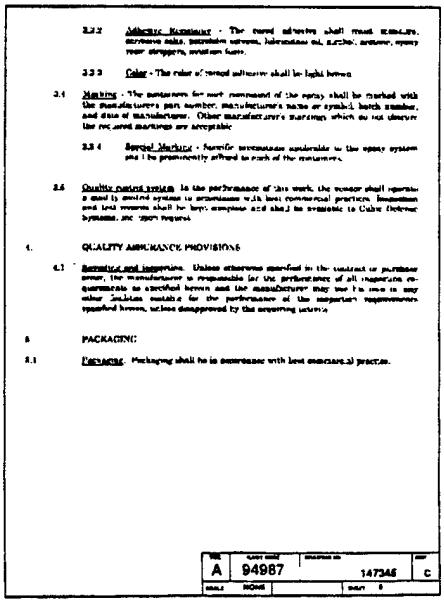
1. This drawing is used on the following contracts.



10.3.2 Files 1R005, 1R006, 1R007, and 2R001

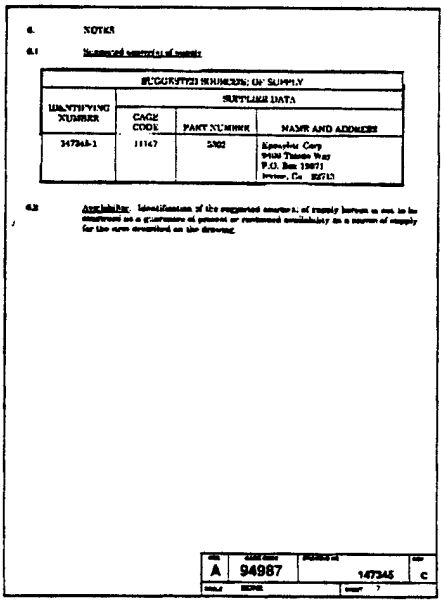


1R005

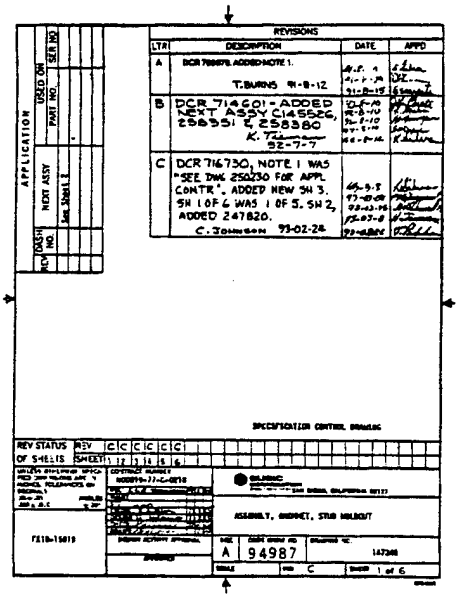


1R006

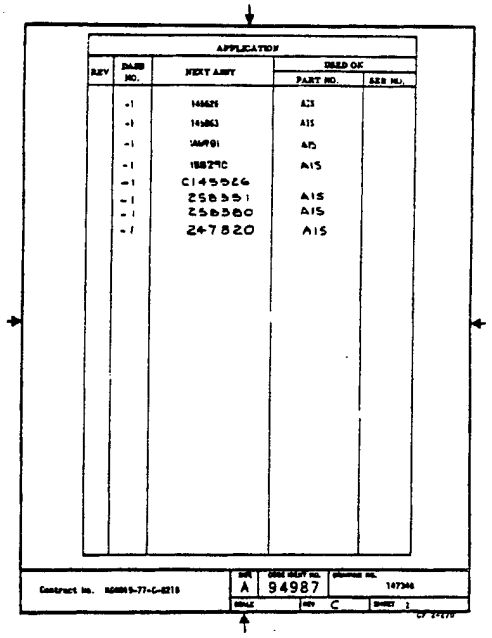
1R007



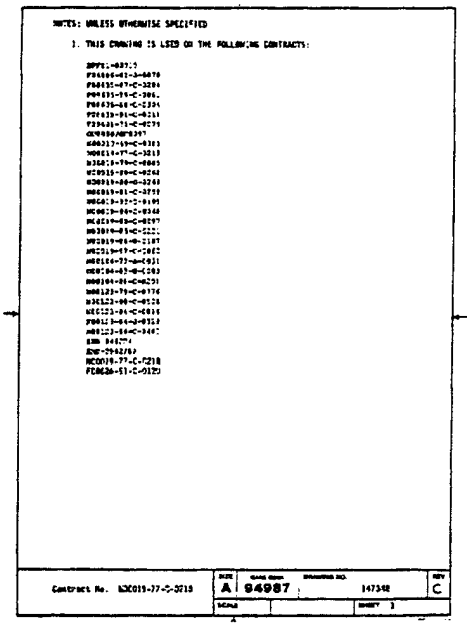
2R001



10.3.3 Files 2R002, 2R003, 2R004, and 2R005

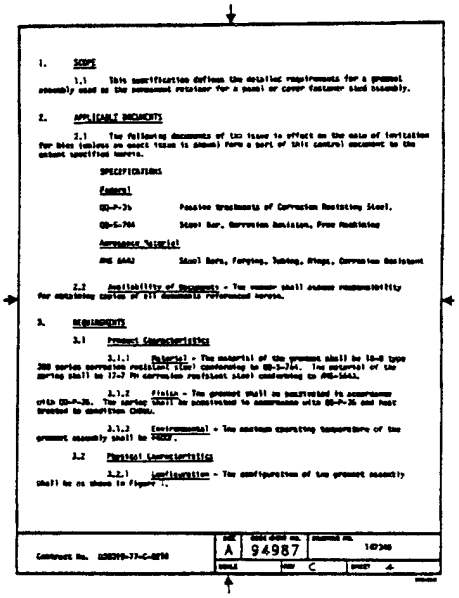


2R002

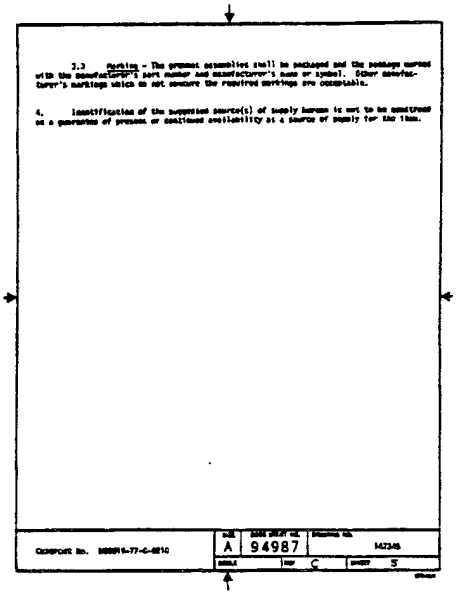


2R003

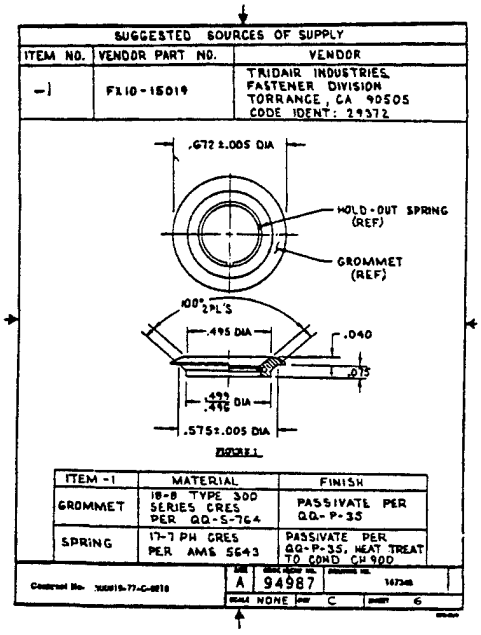
2R004



2R005



10.3.4 Files 2R006, 3R001, 4R001, and 5R001



SUGGESTED SOURCES OF SUPPLY

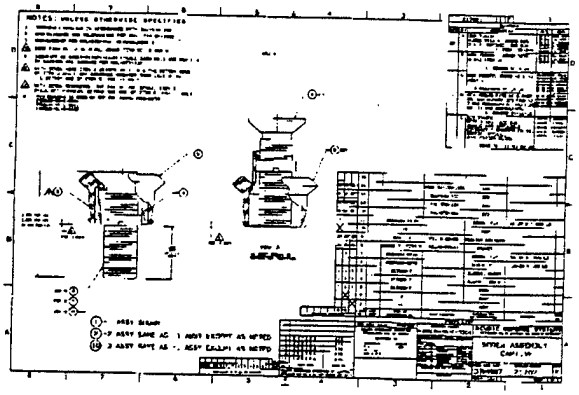
ITEM NO.	VENDOR PART NO.	VENDOR
-1	F110-15019	TRIDAIR INDUSTRIES FASTENER DIVISION TORRANCE, CA 90505 CODE IDENT: 29372

.672 ±.005 DIA
HOLD-OUT SPRING (REF)
GROMMET (REF)
100° 2PL'S
.495 DIA
.040
.499 .446 DIA
.575±.005 DIA

ITEM -1	MATERIAL	FINISH
GROMMET	18-8 TYPE 300 SERIES CRES PER QQ-S-764	PASSIVATE PER QQ-P-35
SPRING	17-7 PH CRES PER AMS 5643	PASSIVATE PER QQ-P-35, HEAT TREAT TO COND CH 900

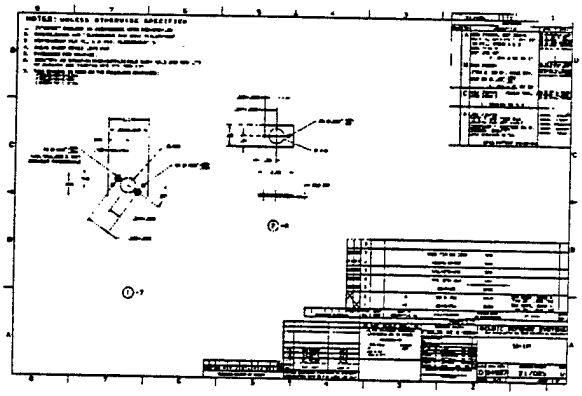
A 94987
SCALE NONE SHT C SHEET 6

2R006

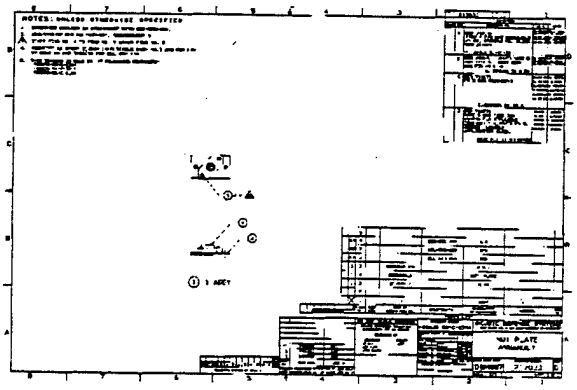


3R001

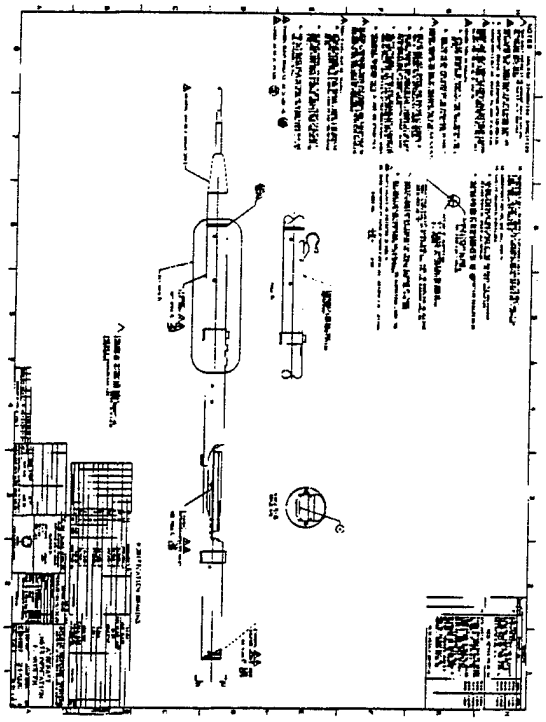
4R001



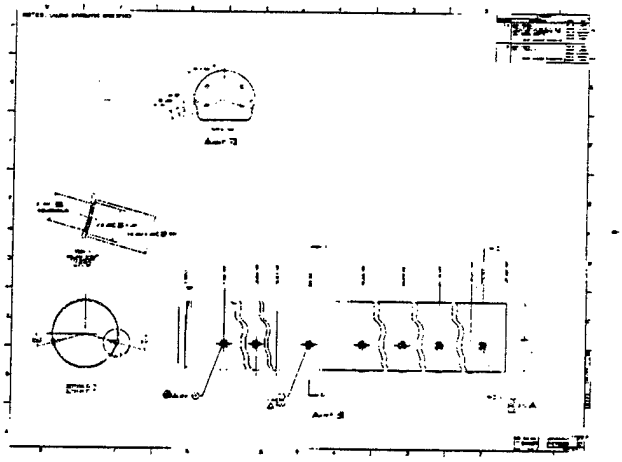
5R001



10.3.5 Files 6R001, 6R002, 6R003, and 6R004

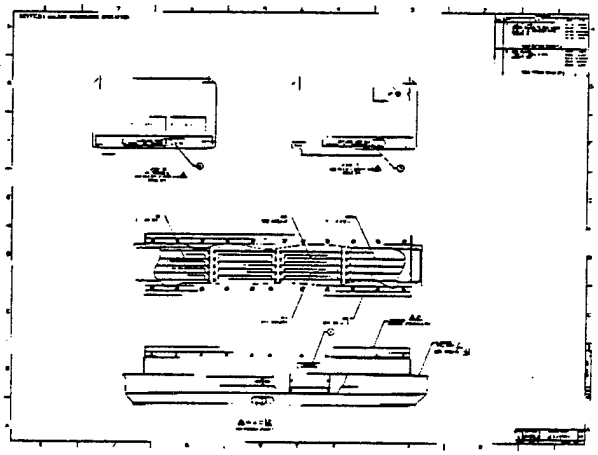


6R001



6R002

6R003



6R004